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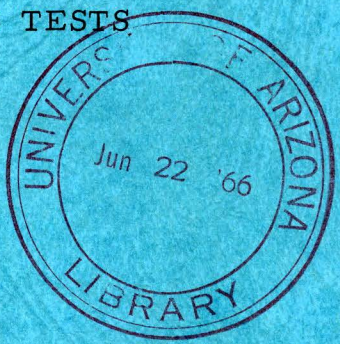
ARIZONA GRAIN SORGHUM, FORAGE SORGHUM, AND SUDANGRASS PERFORMANCE TESTS

1965



by

Robert L. Voigt
Ellsworth A. Baker

ARIZONA AGRICULTURAL EXPERIMENT STATION

THE UNIVERSITY OF ARIZONA

TUCSON

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1965

TABLE OF CONTENTS

ACKNOWLEDGMENT

The following commercial companies expressed an active interest in retailing their products to Arizona Farmers and made seed available for testing.

Advance Seed Company

Asgrow Seed Company (ASG)[1/]

DeKalb Agricultural Association, Inc.

Excel Sorghum Company

Frontier Hybrids, Inc.

Horizon Seed Company

Lindsey Seed Company

Northrup King & Company (NK)[1/]

Paymaster Seed Farms (PM)[1/]

Pfister Associated Growers, Inc. (PAG)[1/]

Pioneer Sorghum Company

Rudy Patrick Seed Company

Taylor Evans Seed Company (TE)[1/]

[1/] Abbreviations used in this publication.

INTRODUCTION

In 1965 Arizona grain sorghum reached a record average yield of 70 bushels per acre (Table 1) which was 1 1/2% above 1964 and an increase of 13% over the 1959 to 1963 average. The continued increase in the grain and forage production rate from year to year is a tribute to the Arizona grower for his use of improved cultural methods, fertilizers, and hybrid seed. A wide variation in Arizona agricultural environments, caused by a range in altitude from sea level to as high as sorghum will grow and produce (over 6000 feet), makes grower recommendations an interesting challenge.

Table 1

Arizona Crop Acreages and Yields of Various Sorghum Products in 1965[1/]

Crop	1965 Acreages	1965 Yields	1964 Yields	1959 to 1963 Yields
Grain Sorghum	165,000	70.0 bu/acre	69.0 bu/acre	61.9 bu/acre
Forage Sorghum	22,000	17.0 tons/acre	16.0 tons/acre	15.4 tons/acre
Sorghum X Sudangrass Hybrids & Sudangrasses	25,000	------	------	------

Sorghum research was conducted predominately at five locations in Arizona in 1965. The sites had been previously selected for their environmental differences which are due chiefly to altitude. Various meteorological data concerning these locations are given in Table 2. Evaluation at these locations of sorghum products sold in Arizona is done to guide the Arizona grower in

[1/] Figures obtained from official USDA acreage releases and Agricultural Extension Service estimates.

selecting something better suited to his particular area. Formal crop recommendations are given in a Crop Recommendation Bulletin published periodically by The University of Arizona Experiment Station. The purpose of this report is to give more detailed information on particular items.

Table 2

Meteorological Data From Sites of 1965 Experiments

Location	Elevation in Feet Above Sea Level	Average Dates of Killing Frosts		Average Length of Growing Season (Days)
		Last	First	
Yuma Valley Exp. Farm	150	Feb. 20	Nov. 26	280
Mesa Exp. Farm	1100	Feb. 25	Nov. 25	273
Marana Exp. Farm[1/]	2000	Mar. 1	Nov. 15	260
Safford Exp. Farm	2900	Apr. 9	Nov. 2	207
Snowflake	5600	May 24	Oct. 3	132

[1/] Data estimated from nearby weather stations.

GRAIN SORGHUM

The following experiments were conducted to evaluate grain sorghum hybrids offered for sale in Arizona. It was not possible to yield test all 88 entries received at all 5 experimental sites in the state. Observational data were obtained at these 5 locations which gave us a good idea of general adaptation regarding maturity. Yield data were obtained at one central location (Marana).

Tables 3, 4, 5, 6, 7, and 8 present yield and other pertinent agronomic data on many of the commercial grain sorghums offered for sale in Arizona.

Some yields are shown as percentages of RS 610, a common check hybrid, which is now generally grown throughout the state. The reason for presenting data in this manner is that yields are relative. One grower may produce twice the yield of that of another grower due to differences in management, but if the yield potential of a new hybrid is 10 per cent more than a known standard, this may be found by either grower. Most growers are acquainted with the performance of RS 610 on his particular farm.

The yield and maturity relationship of the entries in Table 6 is fairly typical. Where possible, considering weather and field rotation problems, later maturing hybrids should be considered for highest yield potential.

Bird damage to grain sorghum is a problem confronted by many Arizona growers in specific areas. Much progress has been made in breeding for bird tolerance and maintaining potential yield. Five bird tolerant hybrid grain sorghums were compared to four non-bird tolerant hybrids at three locations with birds and one location without birds. These results are shown in Table 7.

A valid direct comparison cannot be made between yields with no bird damage at Marana and yields with bird damage at the other three locations since bird damage losses would be confounded with location differences. In the table, by comparing the average yield of the five bird-tolerant entries at Marana with

the four non-bird tolerant entries, we note a 10 per cent lower yield by the non-tolerant entries as a group. Since performance figures are usually relative among locations, we might assume that 90 per cent of the loss by these four non-bird-tolerant entries as a group at each of the other three locations is due to bird damage.

In 1965 most plots used were 2 beds each 30' long. The seeding rate was approximately 8 lbs. per acre, such that the expected plant population was 80,000 per acre. Nitrogen fertilizer was used at an average favorable for grain sorghum production.

Table 3. Agronomic Data From A Single Harvest Grain Sorghum Production Trial of Commercial Entries at Marana, Arizona. 1965[1]

Entry	Yield[2] in Bu/acre	Yield in Lbs/acre	Yield in Per Cent RS-610	Days to 50% Bloom	Height in Inches	Head Exsertion in Inches	Per Cent Lodging
DEKALB BR-60	151.7	8494	128	66	56	8	
GA 615	148.6	8320	126	66	62	4	5
AKS 614	139.2	7754	118	65	54	5	3
NK 273	131.5	7362	111	64	58	4	5
PM PAWNEE	131.5	7362	111	56	54	8	5
EXCEL 707	127.6	7144	108	66	55	6	
PIONEER 820	127.6	7144	108	67	57	8	
TAYLOR EVANS 44	126.8	7100	107	59	58	6	10
HORIZON 80	126.0	7057	106	66	56	5	
PAG 428	126.0	7057	106	59	58	10	15
LINDSEY 788	124.5	6970	105	68	59	8	
TE GRAINMASTER	123.7	6926	105	66	52	6	
PIONEER 846	122.9	6882	104	64	54	7	
DEKALB F-65	121.7	6817	103	68	53	8	
DEKALB F-64	121.3	6795	103	68	65	10	
AMAK R-12	121.3	6795	103	66	52	6	3
ASG DOUBLE T	121.0	6774	102	68	58	6	
ASG PRONTO	119.8	6708	101	59	60	6	22
FRONTIER 413	119.0	6665	101	69	52	4	
FRONTIER 401	118.6	6643	100	63	50	6	
RS 610	118.2	6621	-	62	56	8	7
ASG RAIDER B	116.7	6534	99	66	50	6	
DEKALB D-50A	116.3	6512	98	59	59	8	32
DEKALB F-63	116.3	6512	98	67	61	10	
EXCEL 202	115.9	6490	98	59	58	6	33
TE 66	115.5	6469	98	66	52	7	
TE 88	115.5	6469	98	68	60	9	
ADVANCE 54	115.1	6447	97	62	44	7	
HORIZON 67	115.1	6447	97	66	56	7	
ASG RANGER A	114.7	6425	97	66	56	6	

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Table 3 - Continued

Entry	Yield in Bu/acre	Yield in Lbs/acre	Yield in Per Cent RS-610	Days to 50% Bloom	Height in Inches	Head Exsertion in Inches	Per Cent Lodging
		3456789					
NK 275	114.7	6425	97	66	55	6	
DEKALB C-44B	114.3	6403	97	60	55	6	
DEKALB C-45	114.3	6403	97	60	50	6	
PM COMANCHE	114.3	6403	97	63	53	7	
TE 77	114.3	6403	97	68	60	8	
LINDSEY 555	113.6	6360	96	64	54	4	
AMAK R-10	113.2	6338	96	62	54	8	
NK 222	112.8	6316	95	62	52	8	
FRONTIER 400B	122.4	6294	95	61	55	8	3
ADVANCE 14	112.0	6273	95	62	54	10	
DEKALB C-42	110.8	6207	94	62	52	6	
EXCEL 505	110.5	6186	93	64	56	6	
RS 625	109.7	6142	93	63	50	4	
PAG 665	109.7	6142	93	68	62	6	
NK 310	109.3	6120	92	74	64	10	
RS 626	108.5	6077	92	61	51	4	
PM APACHE	108.1	6055	91	70	52	6	
NK 212	107.7	6033	91	62	52	6	3
DEKALB S-40	107.3	6011	91	60	43	4	
EXCEL B-52	107.3	6011	91	68	60	6	3
PMKIOWA	107.3	6011	91	64	55	6	
GA 609	106.6	5968	90	63	58	6	5
LINDSEY 755	106.2	5946	90	66	60	8	
ASG RICO	105.8	5924	89	66	54	7	
ASG TASCO	105.8	5924	89	65	52	8	
PAG 515	105.8	5924	89	67	59	6	
DEKALB C-44-A	105.8	5924	89	60	50	8	
DEKALB DD-50	104.2	5837	88	59	54	7	28
DEKALB F-61	104.2	5837	88	68	53	8	
EXCEL 606	104.2	5837	88	66	46	6	
		4567891011					

Table 3 - Continued

Entry	Yield in Bu/acre	Yield in Lbs/acre	Yield in Per Cent RS-610	Days to 50% Bloom	Height in Inches	Head Exsertion in Inches	Per Cent Lodging
		4 5 6 7 8 9 10 11					
PAG X3628	104.2	5837	88	67	63	8	5
PIONEER 832	104.2	5837	88	68	58	6	
ADVANCE 22	103.8	5815	88	57	61	11	13
NK 133	103.1	5772	87	59	57	9	3
ADVANCE 57	102.7	5750	87	62	52	8	
DEKALB E-57	102.3	5728	86	64	56	8	
PM UTE	101.9	5706	86	63	48	5	
DEKALB E-56-A	101.9	5706	86	61	56	7	3
EXCEL 303	101.1	5663	86	60	50	7	
DEKALB F-62-A	101.1	5663	86	64	57	9	3
FRONTIER 400C	98.8	5532	84	62	56	8	
PAG 494	98.4	5510	83	67	56	8	
PAG 430	98.0	5488	83	62	56	9	3
ADVANCE 91	96.4	5401	82	70	50	6	
LINDSEY 744	95.7	5358	81	64	56	7	
RS 619	94.9	5314	80	65	48	4	
ASG RED RAIDER A	94.5	5292	80	67	48	6	
TE 66B	94.1	5271	80	66	45	5	
ASG SPIKE	93.3	5227	79	68	48	3	
NK 125	93.3	5227	79	56	50	10	
EXCEL 404	92.6	5184	78	62	52	8	3
NK 255	91.8	5140	78	66	50	4	
RS 640	91.8	5140	78	66	42	4	
DEKALB S-33	90.0	5096	77	56	48	6	5
HORIZON 61	90.2	5053	76	68	54	7	
ASG JUMBO	86.3	4835	73	77	52	4	
NK 115	75.4	4225	64	54	50	7	
DEKALB G-600	73.9	4138	62	72	47	6	

1/ Planted June 4, 1965; harvested November 23, 1965.

2/ Plots = 2 rows (40 inches) x 30 feet, 2 replications. (December 1965 rains and resulting field losses precluded harvest of reliable third and fourth replications.)

Table 4. Average Yield Data for Two Years of Some Hybrid Grain Sorghums. Marana Experiment Farm. 1964 and 1965.

Entry	Yields in Pounds Per Acre		
	1964	1965	1964-65 Average
PM PAWNEE	6639	7362	7000
PIONEER 820	6782	7144	6963
ASG DOUBLE T	6965	6774	6870
NK 310	7422	6120	6771
LINDSEY 788	6547	6970	6758
AMAK R12	6612	6795	6704
ADVANCE 14	6952	6273	6612
DEKALB F-64	6351	6795	6573
FRONTIER 401	6495	6643	6569
PIONEER 846	6194	6882	6538
FRONTIER 413	6403	6665	6534
DEKALB C-45	6521	6403	6462
ASG RAIDER B	6324	6534	6429
PAG 428	5698	7057	6378
DEKALB F-65	5894	6817	6356
NK 222	6338	6316	6327
AMAK R-10	6155	6338	6246
DEKALB C-44B	6077	6403	6240
PM APACHE	6270	6055	6162
PAG 665	6129	6142	6136
FRONTIER 400B	5972	6294	6133
DEKALB E-57	6508	5728	6118
DEKALB C44A	6273	5924	6098
PM COMANCHE	5711	6403	6057
LINDSEY 755	6064	5946	6005
PAG 515	5972	5924	5948
DEKALB F-63	5306	6512	5909
PM KIOWA	5763	6011	5887
ASG RED RAIDER A	6364	5292	5828
FRONTIER 400C	6103	5532	5818
LINDSEY 744	6233	5358	5796
PAG 430	6064	5488	5776
KEKALB S-40	5541	6011	5776
RS 610	4900	6621	5760
DEKALB E-56A	5750	5706	5728
DEKALB F-62A	5737	5663	5700
PAG 494	5881	5510	5696
KEKALB F-61	5436	5837	5636
PM UTE	5489	5706	5598
DEKALB S-33	5998	5096	5547
NK 125	4744	5227	4986

Table 5. Yield and Other Agronomic Data From A Single Harvest USDA Regional Uniform Grain Sorghum Production Trial at Marana, Arizona. 1965[1/]

Entry	Yield[2/] in Bu/acre	Yield in Lbs/acre	Yield in Per Cent RS-610	Days to 50% Bloom	Height in Inches	Head Exsertion in Inches	Per Cent Lodging
RS 671	134.3	7520	129	65	53	4	
MELOLAND	124.0	6944	119	67	56	4	15
65LH20	120.0	6720	115	66	59	6	
65LH26	111.3	6233	107	65	60	6	
RS 626	110.0	6160	106	60	53	5	
CO 585	109.7	6143	105	57	63	4	
NB 505	105.7	5919	102	56	51	9	
633225	104.3	5841	100	61	58	6	10
RS 610	104.0	5824	-	60	54	6	
RS 621	102.7	5751	99	60	45	5	
RS 617	98.7	5527	95	61	57	5	8
633259	96.7	5415	93	65	53	7	
64NMH12	96.3	5393	92	66	51	5	
RS 622	95.0	5320	91	66	47	3	
64NMH13	94.3	5281	91	66	52	4	
RS 608	93.7	5247	90	62	53	6	
RS 625	92.7	5191	89	62	50	4	
64NMH14	92.7	5191	89	67	47	3	
64C5330	91.0	5096	88	66	56	5	
RS 640	84.7	4743	81	66	44	2	
633537	79.3	4441	76	54	49	7	
MARTIN	72.3	4049	70	65	51	5	

[1/] Planted June 4, 1965; harvested November 18, 1965.

[2/] Plots = 1 row (40 inches) x 50 feet; 3 replications.

Table 6. Yield Data of Four Hybrid Grain Sorghums Grown at Safford Experiment Farm. 1965.

Entry	Yield in Pounds Per Acre[1/]	Yield in Bushels Per Acre	Days to 50% Bloom
ASG Double T	5680	101	84
NK 310	5313	95	86
Georgia 615	4642	83	74
NK 125	3318	59	56

[1/] All entries under the same line are considered to be not different in yield at the five per cent level of probability.

Table 7. Grain Yields in Pounds Per Acre of Five Selected Bird Tolerant Grain Sorghum Hybrids and Four Hybrids with Less Bird Tolerance Grown at Four Locations in Arizona. 1965.

	LOCATION				
	SEVERE BIRD DAMAGE				NO BIRD DAMAGE
	YUMA	MESA	SAFFORD	MEAN	MARANA
Five Bird-Tolerant Hybrid Grain Sorghums					
Georgia 615	5799	4302	6957	5686	6933
Georgia 609	5015	4030	6018	5021	6162
Arkansas 614	5064	4029	5823	4972	7115
NK Savanna	4770	4138	5914	4941	6756
RS 617	3651	3594	5490	4245	5482
Mean	4860	4019	6040	4973	6490
Four Non-Bird Tolerant Hybrid Grain Sorghums					
DeKalb S-40	2197	2668	665	1843	5122
PAG 665	680	1797	2178	1552	5704
Advance 14	1300	1198	814	1104	6541
RS 610	1005	1089	814	969	5926
Mean	1296	1688	1118	1367	5823
Mean Difference in Pounds From Bird Tolerant Entries	-3564	-2331	-4922	-3606	-667 (10%)

Table 6. Various Agronomic Data of Some Hybrid Grain Sorghums Grown at Five Locations Differing in Altitude and Temperature in Arizona in 1965. Plantings at About the Same Date to Give the Same Photoperiod at All Locations.[1]

	Days to 50% Bloom					Height in Inches					Head Exsertion in Inches			Per Cent Bird Damage		Days to Mature Grain
	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Marana	Snow-flake	Yuma	Mesa	Yuma
ADVANCE 14	58	62	70	69	95	55	43	54	45	48	6	7	8	95	98	100
ADVANCE 22	55	63	66	64	88	59	44	55	45	56	7	8	10	95	99	100
ADVANCE 54	56	67	68	65	94	48	37	42	39	49	3	6	6	90	95	100
ADVANCE 57	62	70	72	78	101	50	46	47	41	50	7	6	9	95	98	102
ADVANCE 91	77	79	87	84	106	48	44	44	38	45	2	4	6	95	60	119
AMAK R10	62	63	72	67	96	51	38	49	38	54	7	10	9	95	98	102
AMAK R12	70	71	80	79	98	52	42	57	41	56	4	6	9	90	60	107
AKS 614	70	69	78	80	94	53	41	52	39	55	3	4	8	5	20	107
ASG DOUBLE T	74	82	81	84	97	54	43	50	41	54	3	5	8	95	95	107
ASG JUMBO	70	71	71	--	96	50	45	49	45	49	8	7	7	95	70	111
ASG PRONTO	58	61	64	67	86	63	46	57	47	60	7	8	8	95	98	100
ASG RAIDER B	70	73	82	84	104	49	45	47	41	48	4	4	8	95	97	107
ASG RED RAIDER A	70	71	81	74	99	44	43	46	36	47	4	5	12	95	95	107
ASG RICO	70	70	80	72	94	54	45	54	40	50	5	6	8	95	98	107
ASG RANGER A	70	72	81	80	103	45	50	49	39	59	5	7	8	99	97	107
ASG SPIKE	86	77	86	88	105	59	43	42	35	45	7	3	6	95	65	121
ASG TASCO	66	69	77	80	94	55	47	51	41	50	6	7	8	95	95	102
DEKALB S-33	52	67	63	60	85	50	39	43	37	54	9	8	9	95	85	100
DEKALB S-40	63	66	72	65	96	36	34	42	37	43	5	4	5	90	90	100
DEKALB C-42	62	65	72	64	104	44	47	46	44	45	8	8	7	90	98	102
DEKALB C-44A	60	66	71	64	101	48	45	46	44	47	5	5	8	90	98	100
DEKALB C-44B	60	67	73	67	102	51	44	48	45	48	7	6	4	90	98	100
DEKALB C-45	58	66	70	65	98	46	39	45	39	42	5	8	7	90	98	100
DEKALB DD-50	58	67	68	69	96	55	50	51	43	49	7	7	10	95	98	100
DEKALB D-50A	58	68	72	61	96	62	54	57	47	63	7	9	12	95	98	100
DEKALB E-56A	62	69	74	71	106	53	47	54	39	52	7	5	8	95	98	100
DEKALB E-57	66	70	76	72	105	48	49	54	43	48	4	8	7	90	90	102
DEKALB BR60	74	75	83	82	99	56	49	52	41	52	5	7	8	25	15	119
DEKALB F-61	74	81	88	84	108	49	50	57	42	48	3	4	4	97	98	119
DEKALB F-62A	70	70	80	74	100	53	50	54	43	52	5	6	8	95	96	107

Table 8. Various Agronomic Data of Some Hybrid Grain Sorghums Grown at Five Locations Differing in Altitude and Temperature in Arizona in 1965. Plantings at About the Same Date to Give the Same Photoperiod at All Locations.[1/]
Cont.

	Days to 50% Bloom					Height in Inches					Head Exsertion in Inches			Per Cent Bird Damage		Days to Mature Grain
	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Marana	Snow-flake	Yuma	Mesa	Yuma
DEKALB F-63	70	76	81	78	98	54	53	57	41	53	2	9	5	95	98	111
DEKALB F-64	84	77	88	91	108	64	57	63	42	54	7	8	9	99	98	121
DEKALB F-65	74	77	83	79	97	48	48	46	37	54	4	6	11	96	97	119
DEKALB G-600	74	73	87	79	111	46	43	47	38	39	4	4	4	97	60	121
EXCEL B52	78	77	84	82	97	48	51	57	41	51	3	7	8	95	98	121
EXCEL 202	58	66	--	72	90	55	47	58	43	56	4	8	9	98	97	100
EXCEL 303	60	66	72	72	97	44	42	48	37	45	7	6	6	98	98	100
EXCEL 404	63	65	74	74	105	47	43	52	39	46	7	8	7	98	98	102
EXCEL 505	63	67	73	80	106	49	43	50	41	53	6	6	7	95	98	102
EXCEL 606	74	71	82	81	104	41	44	44	34	45	3	5	6	95	60	111
EXCEL 707	76	71	82	83	104	50	46	53	40	50	2	4	7	95	90	119
FRONTIER 400B	62	64	73	69	105	54	45	52	39	54	7	10	9	95	98	102
FRONTIER 400C	62	63	72	77	101	53	45	51	42	58	7	10	6	95	98	102
FRONTIER 401	74	69	83	84	97	54	44	49	34	42	5	4	4	95	85	119
FRONTIER 413	81	82	85	86	99	51	44	50	45	55	2	3	3	95	75	119
GA 609	62	70	75	68	106	61	44	56	43	61	5	5	7	15	25	102
GA 615	74	70	85	74	107	55	49	60	43	53	3	3	4	7	20	119
LINDSEY 555	70	68	74	81	106	46	45	49	36	50	8	7	8	95	98	107
LINDSEY 744	63	67	73	69	105	50	47	57	38	50	6	10	8	98	98	102
LINDSEY 755	70	72	82	78	100	58	51	61	43	54	5	7	9	95	98	107
LINDSEY 788	74	83	82	81	98	53	50	58	44	54	5	7	8	98	96	111
HORIZON 61	70	71	83	80	107	43	45	46	41	46	4	5	6	95	75	107
HORIZON 67	70	70	82	80	105	48	44	50	41	54	4	4	9	95	80	111
HORIZON 80	70	71	83	80	105	45	46	51	41	52	2	5	7	95	80	107
NK 115	52	62	61	55	82	41	34	46	39	46	7	8	8	80	90	100
NK 125	52	68	63	56	87	50	38	50	43	49	7	10	7	90	98	100
NK 133	58	66	66	64	100	52	39	48	40	48	6	6	6	95	96	102
NK 212	62	63	69	74	106	52	40	51	41	51	6	7	6	95	98	102
NK 222	58	63	72	64	101	45	42	47	40	41	5	5	5	95	98	102
NK 255	70	68	85	80	107	48	42	48	40	39	2	4	7	95	96	107

Table 8. Various Agronomic Data of Some Hybrid Grain Sorghums Grown at Five Locations Differing in Altitude and Temperature in Arizona in 1965. Plantings at About the Same Date to Give the Same Photoperiod at All Locations.[1/]
Cont.

	Days to 50% Bloom					Height in Inches					Head Exsertion in Inches			Per Cent Bird Damage		Days to Mature Grain
	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Marana	Snow-flake	Yuma	Mesa	Yuma
NK 273	70	69	80	79	97	45	48	58	36	46	3	2	9	5	20	119
NK 275	74	71	80	82	102	41	49	50	37	49	3	3	8	98	75	119
NK 310	74	80	73	86	94	56	49	54	39	52	5	5	11	95	85	119
PAG 428	58	61	69	74	105	54	50	57	45	48	6	8	5	95	98	100
PAG 430	62	63	72	77	104	52	39	55	40	52	8	9	10	98	98	100
PAG 494	74	72	77	84	105	49	46	54	39	48	3	7	11	97	98	107
PAG 515	74	71	81	78	104	52	48	59	41	52	5	6	8	97	95	107
PAG 665	77	75	82	82	105	50	49	58	43	51	3	5	9	99	98	107
PAG X3628	81	76	80	85	109	54	54	60	47	53	5	6	6	95	98	119
PIONEER 820	83	77	85	86	111	46	50	56	42	46	5	4	5	95	90	121
PIONEER 832	76	74	85	87	114	55	49	54	43	48	4	4	8	95	95	119
PIONEER 846	63	70	74	77	107	51	46	57	43	45	7	8	8	95	98	100
PM APACHE	76	80	85	84	106	56	44	50	42	54	4	6	9	98	85	119
PM COMANCHE	58	68	72	67	102	56	45	48	41	49	7	7	7	99	98	100
PM KIOWA	65	69	72	75	103	47	42	47	44	54	6	5	9	95	98	107
PM PAWNEE	52	65	64	61	83	55	43	51	45	55	5	7	11	99	98	100
PM UTE	65	67	72	72	104	43	42	40	40	45	4	3	8	95	98	107
RS 610	62	65	70	67	105	52	46	48	43	56	7	8	10	95	98	100
TE 44	58	66	65	62	92	55	46	53	40	51	5	10	6	50	98	100
TE 66	74	70	77	85	105	44	44	45	33	46	3	5	8	98	98	107
TE 66B	76	71	77	84	109	36	42	36	31	37	0	1	4	98	85	111
TE 77	77	77	80	83	102	53	51	48	40	54	3	3	9	95	98	107
TE 88	78	76	78	82	101	48	46	53	42	54	4	4	10	95	95	107
TE GRAINMASTER	74	71	78	75	106	46	40	47	41	52	5	3	7	95	40	111

[1/] Dates of planting: Yuma, Mesa, and Marana on May 11; Safford and Snowflake on May 15.

FORAGE SORGHUM AND SUDANGRASS

Production trials of forage sorghums for silage purposes were conducted at three locations in Arizona in 1965 (Yuma, Mesa and Safford). The yields and other pertinent agronomic information on forage sorghums are presented in Tables 9, 10, 11, 12, 13, and 14.

Adapted hybrids will produce more dry matter per acre than adapted varieties. Lodging is a serious problem and seems to vary in degree from one area to another. Some high yielding hybrids and varieties tend to lodge considerably, hence they would not be recommended under conditions tending to produce lodging. Lower elevations (higher temperatures) have long growing seasons, tending to produce much growth which consequently tends to lodge. Under these conditions perhaps the selection of earlier maturing sorghums, those shorter in height (either hybrid or variety) and judicious rate of fertilizer application might all help to reduce lodging. It may be necessary to exchange some yield for standing ability in the field.

These results are from test plots with border rows replicated four times and seeded at about 12 pounds per acre. Only the center row or rows were harvested at the soft to hard dough stage of development.

Yield and other agronomic data on nine commercial sudangrass or sudangrass x sorghum types are given in Table 15. Yield results are given in tons per acre of oven-dry plant material.

Table 9. Agronomic Data From a Single Harvest of Forage Sorghum at Yuma, Arizona. 1965.[1/]

Entry	Yield in Tons/Acre @ 30% Dry Matter[2/]	Yield in Per Cent of Low Entry	Average Production in Tons/Acre/Day	No. of Days from Planting to Harvest	Height in Inches	Per Cent Lodging	Per Cent Dry Matter at Harvest	Days to 50% Bloom	Per Cent Bird Damage
TE YIELDMAKER	39.18	198	.373	105	109	33	29.2	80	80
PIONEER 940	37.17	188	.295	126	110	8	30.1	91	95
LINDSEY 101F	37.10	188	.331	112	108	15	26.9	86	92
LINDSEY LEH 4031F	37.01	187	.330	112	101	8	28.8	88	87
LINDSEY LEH 4048F	36.90	187	.351	105	95	1	32.9	82	72
TE 2418X	33.63	170	.267	126	107	7	26.4	92	95
TE GOLDMAKER	30.24	153	.329	92	98	53	28.0	64	83
PM 3 LITTLE INDIANS R	28.10	142	.305	92	118	27	29.6	64	18
ASG DUET	27.70	140	.301	92	87	5	24.2	73	88
RUDY-PATRICK 30F	27.55	139	.299	92	99	67	28.0	64	65
ADVANCE 107lF	24.83	126	.270	92	107	53	28.3	63	83
REGULAR HEGARI	19.75	100	.215	92	67	10	24.8	64	95

[1/] Planted in moist soil June 7, 1965.

[2/] Plots = 4 rows (40 inches) x 15'; 3 replications. Harvested 6' from each of two center rows.

Table 10. Agronomic Data From a Single Harvest of Forage Sorghum at Mesa, Arizona. 1965.[1/]

Entry	Yield in[2/] Tons/Acre @ 30% Dry Matter	Yield in Per Cent of Low Entry	Production in Tons/Acre/Day	Days to Harvest	Height at Harvest	Per Cent Lodging at Harvest	Per Cent Dry Matter at Harvest	Days to 50% Bloom	Per Cent Bird Damage
ADVANCE 1071F	27.85	189	.284	98	106		30.33	72	38
PIONEER 940	26.36	173	.235	112	80		29.29	86	41
TE GOLDMAKER	26.10	172	.266	98	98		26.80	78	31
RUDY PATRICK 30F	25.54	168	.261	98	97		29.80	73	84
LINDSEY 101F	24.57	162	.251	98	86		28.96	71	12
TE YIELDMAKER	24.09	158	.246	98	82		27.21	76	9
LINDSEY 4031F	22.19	146	.226	98	89		27.46	71	82
PM 3 LITTLE INDIANS R	18.00	118	.184	98	110		29.96	71	1
REGULAR HEGARI	15.20		.155	98	62		29.52	60	44

[1/] Planted dry, irrigated May 11, 1965.

[2/] Plots = 3 rows (36 inches) x 15'; 4 replications. Plot yield from one center row (36 inches) x 15'.

Table 11. Agronomic Data From a Single Harvest of Forage Sorghum at Safford, Arizona. 1965.[1/]

Entry	Yield in[2/] Tons/Acre @ 30% Dry Matter	Yield in Per Cent of Low Entry	Average Production in Tons/Acre/Day	No. of Days from Planting to Harvest	Height in Inches	Per Cent Lodging	Per Cent Dry Matter at Harvest	Days to 50% Bloom	Per Cent Bird Damage
ADVANCE 1085F	36.05	166	.236	153	111	60	35.34	110	100
FRONTIER S-214	30.27	140	.198	153	99	3	32.89	96	100
PAG SI-CHOW 1	28.56	132	.187	153	89	7	30.82	93	100
RUDY-PATRICK 30F	28.31	130	.185	153	82	0	34.48	83	100
LINDSEY 101F	26.25	121	.172	153	68	0	35.14	82	100
HORIZON SF20	24.99	115	.163	153	84	13	31.35	86	100
PIONEER 940	22.46	104	.147	153	63	0	29.66	107	100
ASG DUET	22.20	102	.145	153	68	0	33.65	67	100
REGULAR HEGARI	21.69	---	.142	153	56	0	34.83	--	100

[1/] Planted May 15, 1965, harvested October 15, 1965.

[2/] Plots = 3 rows (38 inches) x 16'; 3 replications. Harvested 12' from center plot row.

Table 12. Average Data for 6 Years on Single Harvest of Forage Sorghums Cut for Silage at Soft to Hard Dough Stage of Seed Development. Yuma Experiment Farm. 1959, 1960, 1961, 1962, 1964, and 1965.

Entry	Yield Tons/Acre @ 30% Dry Matter	Yield in Per Cent of Regular Hegari	Average Production in Tons/Acre/Day	Number of Days to Harvest	Plant Height in Inches	Per Cent Dry Matter at Harvest
Lindsey 101F	31.2	158	.267	117	98	27.4
Regular Hegari	19.7	100	.214	92	74	26.0

Table 13. Average Data for 6 Years on Single Harvest of Forage Sorghums Cut for Silage at Soft to Hard Dough Stage of Seed Development. Mesa Experiment Farm. 1959, 1960, 1962, 1963, 1964, and 1965.

Entry	Yield Tons/Acre @ 30% Dry Matter	Yield in Per Cent of Regular Hegari	Average Production in Tons/Acre/Day	Number of Days to Harvest	Plant Height in Inches	Per Cent Dry Matter at Harvest
Lindsey 101F	30.6	132	.278	110	88	30.5
Regular Hegari	23.1	100	.222	104	64	34.9

Table 14. Various Agronomic Data on Some Forage Sorghums, Sorghum X Sudangrass, and Sudangrass Hybrids Grown at Five Locations Differing in Altitude and Temperature in Arizona in 1965.

Entry	Days to 50% Bloom					Height in Inches					Lodging Per Cent at Hard Dough	Per Cent Bird Damage
	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Yuma
FORAGE SORGHUM												
ADVANCE 1071F	70	78	81	79	111	116	85	114	81	105	25	75
ADVANCE 1085F	83	95	85	110	107	110	86	108	100	85	60	80
ASG DAIRY D	86	79	85	97	119	113	75	107	79	90	75	60
ASG DUET	58	63	64	67	81	78	55	72	67	70	50	75
ASG TITAN	76	77	81	97	103	110	78	96	88	80	60	90
DEKALB FS-1A	62	67	69	74	102	77	68	78	61	66	35	90
DEKALB FS-22	88	81	90	90	120	103	85	118	89	75	75	95
FRONTIER S-214	83	84	88	86	108	105	84	122	92	80	45	60
LINDSEY 92F	70	72	75	76	109	108	83	108	86	100	55	50
LINDSEY 101F	65	75	72	82	107	88	82	90	70	70	60	45
LINDSEY LEH 4031F	70	76	75	97	104	80	76	100	66	54	15	85
LINDSEY LEH 4048F	83	84	87	100	109	90	66	78	65	60	5	20
HORIZON SF20	70	70	80	86	105	110	75	118	78	75	60	90
NK 145	58	51	72	60	92	86	68	90	65	95	30	20
NK 300	62	66	70	69	97	77	70	66	61	65	40	90
NK 330	70	86	77	86	106	100	79	96	66	72	75	90
PAG SI-CHOW I	83	79	85	93	118	112	86	108	88	100	99	90
PIONEER 940	74	83	85	107	108	102	74	84	75	71	99	90
PM CROP GUARD	81	77	88	88	110	120	88	114	97	106	100	60
PM 3 LITTLE INDIANS	70	71	76	83	109	120	92	108	110	115	90	80
PM 3 LITTLE INDIANS R	70	69	75	80	109	125	93	96	107	115	45	85
RUDY PATRICK 30F	70	70	85	83	118	106	77	121	79	100	98	95
TE MILK MAKER	70	69	74	87	108	120	74	120	81	85	100	70
TE GOLD MAKER	83	77	85	90	109	120	76	120	81	90	98	75
TE SILO MAKER	62	70	75	72	108	112	73	108	68	71	98	50
TE YIELD MAKER	70	71	80	88	106	120	74	96	86	80	100	60
TE YIELD MAKER A	70	73	75	83	104	116	73	103	71	80	95	90
TE 2418X	77	85	91	108	110	110	71	90	76	72	60	75

Table 14. Various Agronomic Data on Some Forage Sorghums, Sorghum X Sudangrass, and Sudangrass Hybrids Cont. Grown at Five Locations Differing in Altitude and Temperature in Arizona in 1965.[1]

Entry	Days to 50% Bloom					Height in Inches					Lodging Per Cent at Hard Dough	Per Cent Bird Damage
	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Mesa	Marana	Safford	Snow-flake	Yuma	Yuma
SORGHUM X SUDANGRASS												
ADVANCE 1038G	62	68	71	69	83	110	81	110	95	115	25	20
ADVANCE 1041G	62	69	73	72	112	110	86	96	100	110	20	20
ASG GRAZER	62	68	72	72	111	110	82	120	98	110	75	10
ASG ORBIT	63	68	72	74	95	116	81	125	96	105	40	10
ASG SORGUSBORD	65	70	75	74	102	112	78	102	98	75	40	10
DEKALB SX 11	62	69	72	78	103	115	84	108	94	110	60	5
DEKALB SX 12	83	76	81	88	108	130	106	135	115	115	20	40
EXCEL CHOW MAKER	83	74	83	84	110	136	91	123	110	120	25	30
FRONTIER HIDAN 37	62	69	72	80	108	130	88	106	97	120	45	15
FRONTIER HIDAN 38	74	70	76	88	110	130	94	116	102	110	40	25
LINDSEY 77F	62	69	73	74	96	105	96	110	94	125	80	10
HORIZON SP110	62	68	72	74	85	116	91	116	95	126	20	10
NK SORDAN	63	71	72	83	107	120	92	120	92	115	40	10
PAG SU-CHOW 34	77	75	83	88	103	136	105	133	118	120	20	35
PAG SU-CHOW 35	77	72	81	86	108	136	86	126	102	110	10	25
PIONEER 985	62	69	72	74	105	106	74	102	81	100	90	10
PM SWEET SIOUX	66	72	74	79	101	140	96	135	118	115	20	30
PM THUNDER BIRD	62	70	74	82	104	140	102	133	103	120	30	20
RUDY PATRICK MOR SU	65	70	74	76	106	140	103	132	110	115	30	10
TE HAYGRAZER	70	72	77	79	111	140	101	130	110	110	35	40
TE GRAZEMASTER	74	73	80	84	120	135	100	128	112	115	40	25
TE 3083X	70	70	77	84	107	112	99	100	115	100	75	30
TE 3084X	63	68	74	72	105	115	84	124	97	110	95	5
SUDANGRASS												
NK TRUDAN 1	55	62	68	61	81	98	83	100	90	100	25	0
NK TRUDAN 2	62	70	69	76	82	100	86	110	91	95	25	0
NK TRUDAN 3	63	68	70	81	108	102	81	94	92	95	20	0
NK TRUDAN 4	65	69	69	81	101	100	82	104	94	100	25	0

[1] Dates of planting: Yuma, Mesa, and Marana on May 11; Safford and Snowflake on May 15.

Table 15. Mean Agronomic Performance of Sudangrass Hybrids Cut Repeatedly to Simulate Grazing - Mesa, 1965.[1/]

Entry	Yield[2/] in Tons/Acre of Dry Matter for Cuttings					Total Annual Yield in Tons/Acre of Dry Matter	Total Annual Yield in Tons/Acre at 30% Dry Matter	Per Cent Dry Matter At Harvest Of Cuttings					Height in Inches of Cuttings				
	June 24	July 15	Aug. 7	Aug. 31	Oct. 5												
	1st	2nd	3rd	4th	5th	Total		1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
WHEELER	.839	1.564	1.565	1.435	1.629	7.032	23.44	21	19	19	23	31	40	28	38	25	29
SUDAN #23	.685	1.275	1.486	1.602	1.942	6.990	23.30	19	16	17	20	30	33	25	40	23	32
NK TRUDAN II	1.573	1.483	1.094	1.058	1.347	6.555	21.85	25	17	14	19	35	39	24	45	25	21
ADVANCE 1041G	1.774	1.204	.706	.993	1.392	6.069	20.23	17	17	10	22	38	38	18	37	18	20
HORIZON SP110	1.761	.979	1.312	.810	1.112	5.974	19.91	16	14	14	24	34	44	18	43	18	24
PIONEER 985	2.006	1.434	.845	.666	.814	5.765	19.22	16	18	13	22	40	44	20	35	17	19
SWEET SUDAN	1.005	1.033	1.230	.942	1.123	5.333	17.78	21	13	15	22	41	30	20	37	16	19
RP MOR SU	1.845	1.189	.769	.611	.917	5.331	17.77	16	17	11	21	31	45	20	43	17	20
EXCEL CHOWMAKER	1.796	1.112	.892	.619	.807	5.226	17.42	17	15	15	21	37	40	20	40	19	20

[1/] Planted May 11, 1965 in 12 inch drill rows.

[2/] Yield in tons of dry matter per acre on an oven-dry basis.